A LINEAR-PROGRAMMING MODEL TO EVALUATE GAS AVAILABILITY FOR VITAL INDUSTRIES IN SAUDI-ARABIA

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Summary

Saudi Arabia has realized the huge potential in its natural gas resources and has therefore developed petrochemical industries which utilize the various gas components as their input. Natural gas is associated with oil production, a glut in the oil market reduces the oil production quota and hence the supply of gas (mainly methane and ethane) to these industries. The objective of this paper is to study the impact of oil production on the gas supply to vital industries in Saudi Arabia and determine the minimum level of oil production which sustains its industries. This is achieved by developing a linear programming model for oil production, gas processing and distribution for Saudi Arabia. The model integrates oil fields, gas separator plants, gas plants, fractionation plants and the petrochemical industry. The model optimizes the allocation of oil production to different oil fields while satisfying other vital constraints such as target production of different types of crudes. The results show that a production level of 4 million barrels per day enables Saudi Arabia to satisfy the current demands for methane and ethane.

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